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Determination of troposphere characteristics using signals of satellite navigation systems

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Abstract

Based on two-frequency phase measurements of GNSS signals by ground-based receivers, zenith delays of radio signals in the troposphere are estimated. These estimates are compared with the NCEP/NCAR reanalysis data on weather fields. It is shown that the standard deviation in the values of zenith delays obtained in both ways is about 1 cm on average. According to our calculations, such a level of accuracy permits one to study the interday and intraday dynamics of the troposphere. The temporal resolution of estimates based on the GNSS data is 2 h, which makes it possible to organize atmosphere monitoring using a ground-based network of satellite tracking systems. © 2012 Pleiades Publishing, Ltd.

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Keywords

GNSS, reanalysis, refraction of radio waves, troposphere, zenith delay